

Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US05/018638

International filing date: 23 May 2005 (23.05.2005)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 60/573,134
Filing date: 21 May 2004 (21.05.2004)

Date of receipt at the International Bureau: 11 July 2005 (11.07.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

1339730

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

June 29, 2005

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: 60/573,134

FILING DATE: May 21, 2004

RELATED PCT APPLICATION NUMBER: PCT/US05/18638



Certified by

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

EL988370325US

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Lawrence	Solomon	7810 Alton Villa CT. Boca Raton, FL 33433

☒ Additional inventors are being named on the 1 separately numbered sheets attached hereto**TITLE OF THE INVENTION (500 characters max)**

EXACTLY DIVIDABLE, LAYERED, SCORED TABLET

Direct all correspondence to:

CORRESPONDENCE ADDRESS

Customer Number

Place Customer Number
Bar Code Label here

OR

Type Customer Number here

Firm or
Individual Name

Hedman & Costigan, P.C.

Address

James V. Costigan

Address

1185 Avenue of the Americas

City

New York

State

New York

ZIP

10036-2646

Country

USA

Telephone

212-302-8989

Fax

212-302-8998

ENCLOSED APPLICATION PARTS (check all that apply)

Specification Number of Pages

11



CD(s), Number



Drawing(s) Number of Sheets

1



Other (specify)



Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

Applicant claims small entity status. See 37 CFR 1.27.



A check or money order is enclosed to cover the filing fees



The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number:

08-1540



Payment by credit card. Form PTO-2038 is attached.

FILING FEE
AMOUNT (\$)

\$80.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.



No.



Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE

TYPED or PRINTED NAME Nicholas P. ChiaraTELEPHONE (212) 302-8989Date 05/21/2004

REGISTRATION NO.

52,737

(if appropriate)

Docket Number:

1322-013

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

PROVISIONAL APPLICATION COVER SHEET
Additional Page

PTO/SB/16 (02-01)

Approved for use through 10/31/2002. OMB 0851-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Docket Number

1322-013

INVENTOR(S)/APPLICANT(S)

Given Name (first and middle [if any])	Family or Surname	Residence (City and either State or Foreign Country)
Allan S.	Kaplan	7011 Mallorca Cresent Boca Raton, FL 33433 USA

Number 2 of 2

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

5

**UNITED STATES PATENT APPLICATION
(PROVISIONAL)**

10

**of
Lawrence Solomon**

15

and

Allan Kaplan

20

EXACTLY DIVIDABLE, LAYERED, SCORED TABLET

25

30

EXACTLY DIVIDABLE, LAYERED, SCORED TABLET

5

FIELD OF THE INVENTION

The invention is concerned with the making of a tablet dosage form for the administration of pharmaceuticals or other materials. The novel scored tablets of the invention may be readily and accurately separated into separate parts which contain predetermined quantities of ingredients.

BACKGROUND OF THE INVENTION

15

It is well known to provide tablets for handling pre-measured quantities of materials which allow consumers to use various materials without the need to use expensive and cumbersome measuring devices. Tablets have been used to prepare measured amounts of herbicides, pool-treating chemicals, pigments, pharmaceuticals and other solid products which are used in measured amounts. It is common with these tablets to form the tablet with an indentation, commonly referred to as a "score," that is sized and positioned to enable an end user to break the tablet into one or more components. It is recognized that heretofore a method of producing complete, accurate, and predictable division of active ingredient(s) in a tablet has not been disclosed.

30

Many drugs require dosage adjustments. Tablets such as warfarin are scored and are highly potent and patients are frequently advised by physicians to divide warfarin tablets to effect dosage adjustments. If a patient divides a tablet of this drug, the result is likely to not be an exact division of the tablet. The resultant imprecise dosing may cause adverse medical consequences.

35

SUMMARY OF THE INVENTION

5 The present invention is concerned with a dosage form containing at least two layers, in which at least one layer is conveniently and precisely dividable into sections, by means of one or more scores that extend substantially to an adjacent layer. The dosage form preferentially comprises a
10 layered structure composed of two adjacent layers, one containing the active ingredient or mixture of active ingredients (layer 2) and the other containing either an inert substance or one or more active substances (layer 4), wherein layer 2 is fully breakable in an exact,
15 predetermined manner (such as into two equal halves), whereas layer 4 does not break fully evenly. The reason that layer 2 can be broken into exactly equal halves is that it has a score that extends A) substantially completely into layer 4 or B) substantially to layer 4. Thus, if the tablet
20 is broken, the break will take place A) only or B) substantially only in layer 4.

 The invention also includes the method of administering a pharmaceutical to a patient which comprises administering a
25 dosage form comprising a layered structure having two or more layers, wherein the first layer comprises active ingredient(s) and the second layer comprises inert ingredients, or one or more active ingredients. Said first layer being completely scored to allow it to separate
30 precisely into two or more parts of predetermined amount of active ingredient(s) when the tablet is broken through the score(s).

 The invention further contemplates that the method of
35 breakage may be manual, but manual breakability is not required if mechanical breakage may be conveniently

accomplished by ordinary means such as by utilizing a commercially-available tablet cutter, a kitchen knife, or a penknife ("manual or mechanical").

5 It is contemplated that should it be desired that layer 4 contain active drug, and there be physical incompatibility between any component of layer 2 with layer 4, a thin separating layer, as is well known in the art, may be placed between layers 2 and 4 that is mutually compatible
10 with each layer. In that case, the score of layer 2 will extend substantially at least to the separating layer (not shown), and possibly into layer 4. For convenience, the term "inert layer" when applied to a two-layer tablet hereafter, is intended to encompass the circumstance in
15 which layer 4 as used above contains active drug(s) and is not inert.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

20 Fig. 1 is a side view of a cross-section of a two-layer scored tablet according to the invention, which shows an embodiment in which the score terminates at the interface of the active and inert layers.

25 Fig. 2 is a side view of a cross-section of a two-layer scored tablet according to the invention, which shows an embodiment in which the score extends through the active layer and into the inert layer.

30 Fig. 3 is a side view of a cross-section of a two-layer scored tablet according to the invention, which shows an embodiment in which the score extends through the interface of the active layer into the inert layer and a reinforcing
35 ridge has been formed as part the inert layer.

Fig. 4 is a top view of a two-layer scored tablet according to the invention which has been scored into four sections.

5

DETAILED DESCRIPTION OF THE INVENTION

The present invention is particularly useful when precise dosing is important and patients undergo dosage
10 adjustments from time to time.

Examples of these drugs includes, nonexclusively, warfarin, digoxin, digitoxin, and l-thyroxine.

15 As shown in Fig. 1, the active layer 2 is placed against layer 4 and score 6 is created to extend completely through the active layer to but not into the inert layer. This arrangement allows the active layer to be divided into two exact sections because the break occurs at the interface
20 of the inert and the active layers in such a manner that the portions of the tablet containing the active drug are completely and exactly separable. While this embodiment is a tablet in which the active layer is divided into two parts, it is also possible to provide three or more scores
25 that extend up to or into the inert layer.

Fig. 2 varies from Fig. 1 in that the score extends into layer 4.

30 Fig. 3 varies from Fig. 2 in that a reinforcing ridge 12 is created as part of layer 4 in register with ridge 6 to help protect the tablet from breakage.

Fig. 4 is a top view of an embodiment of the
35 invention in which the tablet is scored to provide sections 14, 16, 18 and 20. Shading 22 is used to show the sloping

walls of the scores while line 24 shows the bottom of the score mark.

The drawings illustrate the scores as being V-shaped but the shape of the scoring profile is not critical to the scope of the invention, and the invention includes scores having any type of profile that allow the precise division of the active layer without regard to the accuracy of the division of the remainder of the tablet.

It is contemplated that the different layers may either have the same or different colors.

The tablets may be made using conventional ingredients such as those disclosed in standard textbooks such as Remington's Pharmaceutical Sciences, 17th Ed. (1985) pp. 1603-1632, which are incorporated by reference.

The technique of making the tablets may comprise first feeding a granulation of the inert component into a tablet die and tamping the granulation into place. Then, a granulation of the active drug is placed on top of the tamped inert granulation and an embossed die having the reverse configuration of a score mark(s) is applied to the top of the granulation of the active ingredient to form the tablet with a groove or grooves (or score(s)) being pressed into the active layer by the embossed die as described above.

As examples, layer 2 may contain one or more of the following, and layer 4 may be substantially inert or may contain one or more of the following as well.

The following list discloses a variety of active pharmaceutical ingredients which could be given singly or in combination either in layer 2 or layer 4, with layer 4 in the invention's more preferred embodiment containing no

active drug. These examples are a small subset of the possible examples, which comprise substantially every tabletable drug or drug combination that has existed, is in existence, or that may come to exist.

5

HYPOGLYCEMIC AGENTS:

Thiazolidinediones: Pioglitazone, rosiglitazone

10 Sulfonylureas: Glyburide, glipizide, glimepiride,
chlorpropamide

Biguanides: Metformin

Meglitinides: Nateglinide, repaglinide

Glucosidase inhibitors: Acarbose, miglitol

15

ANTIHYPERTENSIVE AGENTS:

Beta-blockers:

20 Acebutolol, atenolol, bisoprolol, celiprolol, metoprolol,
mebivolol, carvedilol (a mixed alpha-beta blocker), nadolol,
oxprenolol, penbutolol, pindolol, propranolol, timolol,
betaxolol, carteolol,

Calcium antagonists (calcium-channel blockers):

25 Nifedipine, amlodipine, verapamil, diltiazem, nisoldipine,
felodipine, isradipine, lacidipine, lercanidipine,
nicardipine, manidipine

30 Thiazide-type diuretics (with or without potassium-retaining
diuretics such as triamterene, amiloride, spironolactone,
etc.):

Hydrochlorothiazide, chlorothiazide, cyclopenthiazide,
polythiazide, bendrofluazide, hydroflumethiazide,
chlorthalidone, indapamide, methylclothiazide, metolazone

35 Angiotensin converting enzyme inhibitors:

Captopril, enalapril, lisinopril, ramipril, trandolapril, quinapril, perindopril, moexipril, benazepril, fosinopril

5 Angiotensin receptor blockers:

Losartan, valsartan, candesartan, telmisartan, eprosartan, irbesartan

10 High-ceiling (loop) diuretics (with or without potassium-retaining diuretics such as triamterene, amiloride, spironolactone, etc.):

Furosemide, torsemide, ethacrynic acid, bumetamide

Aldosterone antagonist diuretics:

15 Spironolactone, eplerenone

Alpha-blockers:

Doxazosin, terazosin, prazosin, indoramin, labetolol (a mixed alpha-beta blocker)

20

Central alpha-agonists:

Clonidine, methyldopa

Imidazoline:

25 Moxonidine

Direct vasodilators:

Hydralazine, minoxidil

Adrenergic neuronal blocker:

30 Guanethidine

LIPID-MODIFYING AGENTS:

A) Statins:

Lovastatin, simvastatin, pravastatin, rosuvastatin,
atorvastatin, fluvastatin

5 B) Fibrates:

Clofibrate, bezafibrate, fenofibrate, gemfibrozil,
ciprofibrate

C) Others:

10 Ezetimide, niacin, acipimox

While certain preferred and alternative
embodiments of the invention have been set forth for
15 purposes of disclosing the invention, modifications to the
disclosed embodiments may occur to those who are skilled in
the art. Accordingly, this specification is intended to
cover all embodiments of the invention and modifications
thereof which do not depart from the spirit and scope of the
20 invention.

Claims:

- 5 1. A dosage form comprising a structure consisting of at least two stratified layers of different composition, wherein a layer comprises one or more active ingredients and is exactly and predictably dividable by a scoring pattern placed into or substantially to an adjacent layer which is substantially an inert layer, or contains one or
10 more active ingredients.
- 15 2. A dosage form as defined in claim 1 wherein the score extends completely through the active layer and ends at the interface between the active layer and the inert layer.
- 20 3. A dosage form as defined in claim 1 wherein the score extends completely through the active layer and past the interface between the active layer and the inert layer so that the score ends in the inert layer.
- 25 4. A dosage form as defined in claim 1 wherein the unscored or incompletely scored layer contains active drug or drugs.
- 30 5. A dosage form as in claim 4 wherein an inert separating layer exists and the unscored or incompletely scored layer contains active drug(s).
- 35 6. A method of administering a pharmaceutical to a patient which comprises administering a dosage form as in claim 1, wherein a first layer comprises one or more active ingredients and is exactly and predictably dividable by a scoring pattern placed into or substantially to an

adjacent layer which is substantially an inert layer, or contains one or more active ingredients.

5 7. A method as defined in claim 6 wherein the score in the dosage form extends completely through the active layer and ends at the interface between the active layer and the inert layer.

10 8. A method as defined in claim 6 wherein the score in the dosage form extends completely through the active layer and past the interface between the active layer and the inert layer so that the score ends in the inert layer.

15 9. A method as defined in claim 6 wherein the unscored or incompletely scored layer of the dosage form contains active drug or drugs.

20 10. A method as defined in claim 6 wherein the dosage form has an inert separating layer and the unscored or incompletely scored layer contains active drug.

ABSTRACT

A dosage form comprising a structure consisting of at least two stratified layers of different composition, wherein a layer comprises one or more active ingredients and is exactly and predictably dividable by a scoring pattern placed into or substantially to an adjacent layer which is substantially an inert layer, or contains one or more active ingredients.

1322-013

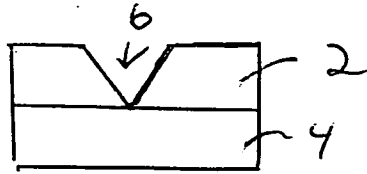


FIG. 1

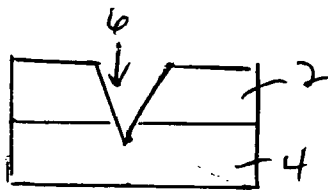


FIG. 2

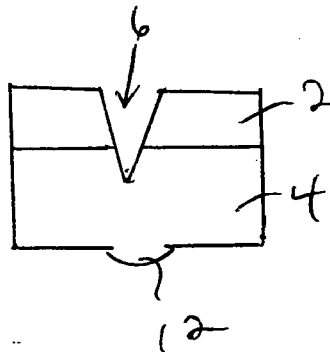


FIG. 3

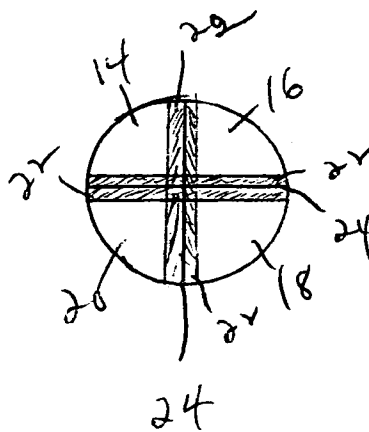


FIG. 4